BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AIR FORCE INSTRUCTION 11-290

AIR FORCE MATERIEL COMMAND
Supplement 1

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Flying Operations

COCKPIT/CREW RESOURCE MANAGEMENT TRAINING PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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(SMSgt Hushion, DSN 872-3929)

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This supplement does not apply to the Air National Guard or US Air Force Reserve units and members.

AFI 11-290, 1 July 1998, is supplemented as follows:

1. AFMC defines crewmember, for the purpose of CRM, as all pilots, navigators, flight test engineers, flight engineers, loadmasters, and boom operators. DFOs may designate other personnel (such as test conductors) as crewmembers for the purpose of this supplement.

2.1.1. For the purpose of AFMC, initial CRM training is defined as CRM training that was either conducted as part of initial flight training (i.e., ATC/AETC), or the first academic CRM training that a crewmember received. If units receive crewmembers that have not received any type of initial CRM training, they will require CRM academics with emphasis on initial CRM skills and concepts. CRM academic training will be accomplished every three years. Continuation training may include either ground training or simulator/flying training. Aircrews and those aircrews designated by the DFO (IAW para 1) requiring CRM will accomplish a minimum of one CRM continuation training event every 12 months. CRM academic and continuation training events will be documented and tracked through AFORMS. For small flying organizations (with less than four primary crewmembers) which do not utilize AFORMS, CRM events may be tracked in training folders.

2.1.2. CRM skills will be evaluated during all initial and recurring flight evaluations IAW applicable AFI 11-202 series publications. Unit program managers will develop procedures to ensure that flight evaluations are trended in which CRM skills received a "Q-" or "U." Units will use AF Form 4031, **CRM Skills Criteria Training/Evaluation**, for CRM skills training and course evaluation. If used, unit CRM program managers will compile results of the form for trend analysis and provide feedback to the contractor/training program. Disposition of AF Form 4031 will be IAW AFMAN 37-139, *Records Disposition Schedule*.

2.1.3. (Added) The unit DFO will determine if CRM training completed in a previous command satisfies the unit's requirements. In this case, non-AFMC CRM courses may count as fulfilling the requirements

of AFI 11-290 and this supplement and will be documented according to the applicable AFI 11-202 series publications. CRM training completed during simulator refresher training satisfies the requirement of this supplement.

2.2. The AFMC-sponsored CRM training is provided by contractor(s) or unit CRM program managers who have completed AFMC approved facilitator training, and targets the unique AFMC flight test mission. The training focuses on crew management with emphasis on the interaction between flight crews and their supporting test teams.

2.3.1. CRM will be briefed prior to and following all flights. Consult Attachment's 3 and 4 for topics that may be included as part of the pre and post mission briefing.

2.3.2. CRM skills and behaviors will be included in all initial, requalification, mission and upgrade training syllabi as outlined in the applicable AFI 11-202 series publications.

3. Operational control of the CRM program is delegated to Chief, Stan/Eval Division, HQ AFMC/DOV.

5.1. The AFMC program manager is appointed by HQ AFMC/DOV. All AFMC flying locations will designate a primary and alternate CRM program manager to implement the CRM program.

6. AFMC Core CRM Curriculum. Attachment 2 outlines the AFMC core curriculum. It will be included as part of the HQ AFMC/DOV approved continuation and academic CRM training plan.

7. HQ AFMC/SEF will forward to HQ AFMC/DOV all safety mishap reports in which human performance was a contributing factor(s) to the mishap. All levels within the command will ensure the provisions of AFI 91-204, *Safety Investigation and Reports*, Chapter 1, are complied with in regards to releasing privileged information. The AFMC CRM program manager will forward these sanitized reports to AFMC flying organization CRM program managers for incorporation into their local academic and continuation training program.

8.3. Continuation training may be conducted in the simulator, aircraft or in an academic environment. This training will include the normal complement of applicable air and ground crew associated with each unit's specific mission. Training will be accomplished using the following guidelines:

- CRM scenarios will be briefed prior to the mission following guidance contained in this instruction and developed by the unit.
- For multiplace aircraft with mission/operational support crewmembers assigned, emphasis should be placed on enhancing interaction with the total crew compliment during simulated aircraft emergencies (i.e., smoke and fume elimination, egress, etc.).
- For dual placed aircraft, emphasis should be placed on pilot and WSO/FTE interaction during simulated inflight emergencies.
- For single seat aircraft, emphasis should be placed on pilot and ground control/test operations interaction during simulated inflight emergencies.
- Crewmembers may credit an actual aircraft emergency as an annual continuation training event provided that during the debrief crew performance, interaction, CRM skills, and feedback to improve crewmember skills, are thoroughly critiqued and reviewed. For multiplace aircraft, the entire crew must be present during the debriefing.
- During mission debriefing, critique the CRM scenario, crew/pilot performance and interaction, and provide feedback to improve individual and team performance.

8.4. All crewmembers upgrading to instructor qualification will be trained in CRM as part of their instructor training syllabus IAW applicable AFI 11-202 series publications.

8.5. Unit CRM program managers will attend (as training allocation slots become available) an HQ AFMC/DOV approved facilitator course prior to instructing CRM continuation or academic training but no later than one year after assuming duties as the unit CRM program manager. Units who are awaiting training allocation slots may continue to instruct, using their locally developed courseware, until completing HQ AFMC/DOV approved facilitators course. Units will ensure personnel selected to attend this course will have one year retainability as the unit program manager upon graduation. This provision does not apply to those units who receive their CRM training from a contractor.

Attachment 2

AFMC CORE CRM CURRICULUM

AFMC Core CRM Curriculum. The six fundamental areas are shown below with subareas to provide all facilitators, instructors, and evaluators with common ground from which to reinforce CRM principles. This attachment can also be used to develop local training syllabus or developing CRM scenarios. It also provides a baseline from which to evaluate performance.

Situational Awareness

- Communication: Crewmembers check in with each other during times of high and low workload to maintain situational awareness and to remain alert.
- Automated Systems: The crew establishes guidelines for the operation of automated systems (i.e., when they will disable systems and when they must verbalize and acknowledge programming actions).
- Optimal Use: When programming demands could reduce situational awareness and create work overloads, the crew reduces the level of automation or disengages automated systems.
- Divisions of Duties: The crew outlines the duties of the pilot flying and the pilot not flying with regard to automated systems (i.e., data entry and cross-checking).
- Status Updates: Crewmembers periodically review and verify the status of aircraft automated systems.
- Coordination: Crewmembers verbalize and acknowledge entries and changes to automated systems parameters.
- Programming: The crew plans for sufficient time for programming of flight management computer prior to maneuvers.

Crew Coordination/Flight Integrity

- Team Building: The crew establishes guidelines for coordination between all crew positions and ground or flight test personnel. The entire crew participates in briefings as a team, when appropriate.
- Crew Environment: Crewmembers establish and maintain a team concept and an environment for open communication (i.e., crewmembers listen with patience, do not interrupt or "talkover," do not rush through briefings, make eye contact when appropriate).
- Operational Situation: The group climate matches the operational situation (i.e., presence or lack of social conversation). The crew also ensures these nonoperational factors do not interfere with necessary tasks.
- Effective Inquiry: Crewmembers openly ask questions regarding crew actions and decisions.
- Effective Advocacy and Assertion: Crewmembers speak up and state their information with appropriate persistence, until there is some clear resolution and decision.
- Conflict Resolution: When conflicts arise, the crews focus remains on the problem or situation at hand. Crewmembers listen actively to ideas and opinions and admit mistakes when wrong.

Communication

- Crew Briefings: Operationally thorough, interesting, and address crew coordination while planning for potential problems. The crew sets expectations on how to handle deviations from normal operations.
- Performance Feedback: Crewmembers provide positive and negative performance feedback at appropriate times and create a positive learning experience for the whole crew - - feedback is specific, objective, based on observable behavior, and constructive.
- Feedback Acceptance: Crewmembers accept performance feedback objectively and nondefensively.
- Workload Communication: Crewmembers clearly communicate workload and task distribution and receive acknowledgment from other crewmembers. The crew allots adequate time to complete tasks.

Risk Management and Decision Making

- Aircraft Commander/Flight Lead Leadership: The aircraft commander coordinates activities to establish a proper balance between command authority and crewmember participation while acting decisively when the situation requires.
- Crew Participation: Crewmembers clearly state operational decisions to other crewmembers and receive acknowledgment. The crew includes all crewmembers and others when appropriate.
- Crew Preparation: The crew prepares for expected and/or contingency situations including approaches, weather, etc.

Task Management

- Task Prioritization: The crew prioritizes secondary operational tasks (e.g., completing required test points versus completing training events) to retain sufficient resources to deal effectively with primary flight duties.
- Fatigue: During long duty periods, crewmembers are proactive in remaining alert and plan and use fatigue countermeasures.
- Self-Imposed Stress: The crew's actions do not create self-imposed stress and additional workload (e.g., late descent due to lack of situational awareness/planning).
- Overload Recognition: Crewmembers recognize and report when their duties or the duties they observe others performing cause an overload.
- Stress Level: The crew remains calm under stress.

Mission Planning/Debrief

- Mission Planning: Did the planned mission match the flown mission? If not, what actions could the crew have taken to accomplish the planned mission?
- Debrief: The aircraft commander/flight lead should discuss, with the crewmembers' participation, the flight history. Emphasis should be placed on steps to enhance crew and mission effectiveness, and lessons learned.
- Communication: Test conductors, mission commanders, or designated representative will be the single point of contact with the aircrew for the mission, planning and coordination.

Attachment 3

CRM TRAPS AND TOOLS

This attachment was developed to highlight CRM areas that crews may want to consider when briefing CRM prior to flight and developing or evaluating CRM training scenarios. Units are authorized to reproduce this attachment and place it in local flight briefing guides.

TRAPS – Accidents have been caused by inadequate performance of people who had the capacity to perform effectively yet failed to do so. This ineffective behavior results from a combination of personality traits and attitudes. These "traps" become BARRIERS to effective teamwork. They reveal themselves on every flight; they are always there. We must constantly be aware of them and find ways to prevent them from not allowing us to achieve safe and efficient flight operations.

- **EXCESSIVE PROFESSIONAL COURTESY** – In general, we are hesitant to call attention to deficient performance in others, particularly if they are senior to us. Thus, even when one crewmember does address our performance, which is outside of established parameters, it is typically done with very little emphasis. For example, the copilot will usually inform the pilot that he or she is "a little fast" or "a little slow" no matter how far off he or she is.
- **HALO EFFECT** – The Halo Effect comes into play when an individual with a significant amount of experience on one type of aircraft is transitioning to a new type of aircraft. Typically that pilot or crewmember is given a very accelerated checkout on the new aircraft, because if they have so much experience on "X," they can certainly handle "Y." The "Halo" of expertise and the rush to get the person on line blinds everyone to the major differences between the aircraft and the need for a more extensive training program.
- **THE PASSENGER SYNDROME** – This is sometimes call the "Copilot Syndrome" and is based on a comforting premise that one or more other crewmembers have the situation under control and are looking out for your best interest. The Halo Effect can lead to Passenger Syndrome.
- **HIDDEN AGENDA** – Sometimes a crewmember may be making suggestions or decisions on information or desires the rest of the crew are not aware of, such as a strong desire to make it back to base due to important plans. We need to communicate honestly all motives involved so that decisions can be made rationally and based on the facts rather than on wishful thinking.
- **ACCOMMODATION SYNDROME** – This is a theory that explains a decreasing human arousal to a stimulus because of repetition combined with the passage of time. If a crew-member is subject to stress repeatedly during a mission, the theory holds that he or she would be less responsive to stress later in the mission. For example, a stressful event in any mission is the final descent and landing; and the landing phase is one of those where many accidents occur. The Accommodation Syndrome could cause a letdown during that high accident exposure time.
- **STRENGTH OF AN IDEA** – Strength of an idea can be defined as an unconscious attempt to make available evidence fit a preconceived situation. It has been observed that once a person or group of people get a certain idea in their head(s), it can be difficult or impossible for them to alter that idea no matter how much conflicting information is received. In a highly stressful situation it becomes even more important that we not allow our attention to focus or become channelized on only one area.
- **SUDDEN LOSS OF JUDGEMENT (SLOJ)** – This is a condition in which an individual's decision making abilities become impaired. Even the most capable and experienced crews are suscep-

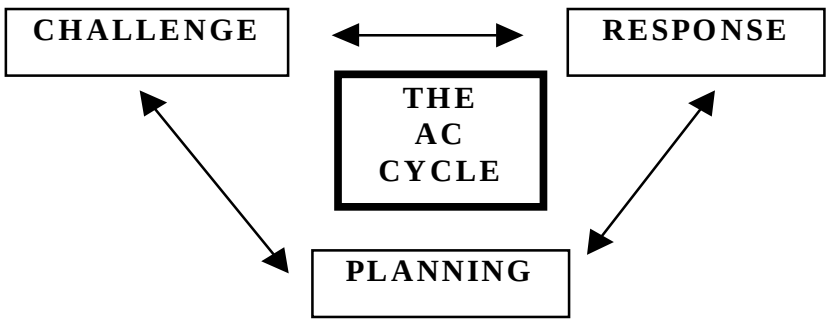
tible to this condition. It's generally precipitated by a real or perceived pressure to perform or by workload/stress related issues.

- **HAZARDOUS ATTITUDES** – There are six hazardous attitudes which can impede our good judgment and decision-making abilities and often lead to Sudden Loss of Judgement. These attitudes may be an inherent part of our personality, or may be a short term factor due to a particular situation. The six hazardous attitudes are:
  - Anti-Authority
  - Macho
  - Resignation
  - Impassivity
  - Invulnerability
  - Get there-itis
- **ERROR CHAIN** – While accident reports will mention an event that was the ultimate cause of the mishap, there are always "contributing causes." This series of errors, poor judgment, and poor decisions led up to the final and fatal cause. Our task as professional aviators is to recognize the emerging "Error Chain" and "Break the Chain."

TOOLS - Performance techniques and procedures can be developed, trained and used to avoid and defeat TRAPS. These practical TOOLS must be taken to the aircraft and used on every flight.

- **STANDARD COCKPIT OPERATING PROCEDURES (SCOP)** – These procedures provide a predictable environment for developing and reinforcing Crew Resource Management skills. By SCOP we mean a written set of procedures which go beyond the existing checklists, detailing:
  - Who flies the aircraft
  - Who briefs the emergency
  - Who makes the call outs and when
  - Who does the miscellaneous procedures
- **THE ASSERTIVE STATEMENT** – This is a nonthreatening method by which a crewmember can directly communicate his or her concerns about a situation with which they are uncomfortable. The five step process is: get the attention of the individual, state the concern, state the problem, offer a solution and then obtain agreement.
- **TIME OUT** – An assertive statement which provides a clear warning sign of a deviation or loss of situational awareness and provides an opportunity to break the "Error Chain" before a mishap occurs. It is designed to provide each crewmember the opportunity to voice inputs relative to the stated concern, which will improve the aircraft commander's decision quality.
- **TWO CHALLENGE RULE** – This rule provides for automatic assumption of duties from any crewmember who fails to respond to two consecutive challenges. This overcomes our natural tendency to believe the pilot flying must know what he or she is doing, even as they depart from established parameters.
- **STERILE COCKPIT** – This requires "business only" discussions during periods of flight. The policy can happen when passing specific altitudes or upon completion of checklists, whichever fits your particular mission.
- **QPIDR** – This is an acronym for a decision making model. The letters represent **Q**uestion, **P**ropose **I**deas, **D**ecide, **R**eview. This model is also a synergy formula. Synergy will result if the crew will follow the model, because they are encouraged to participate in and make decisions.

- **AESOP** – Another acronym that allows aircrew to identify all risks prior to and during the flight. The five risk elements, which affect flight crew performance, are **A**ircraft, **E**nvironment, **S**ituation, **O**perational, and **P**ersonnel. Reviewing these can be a very effective mind-jogger to be sure that important (though less obvious) factors are not inadvertently overlooked.
- **ANTIDOTES FOR HAZARDOUS ATTITUDES -**
  - "Follow the rules; they're usually right"
  - *"Not so fast! Think first"*
  - *"It could happen to me", "Taking a chance is foolish"*
  - *"I'm not helpless, I can make a difference"*
  - *"It's better to get there late than not at all"*
- **AIRCREW COORDINATION (AC) CYCLE** – The AC Cycle is a useful tool that can be applied throughout the flight. It is systematically organized, practical, and a very effective operational approach for coping with challenges as an integrated flight crew.



Attachment 4

CRM BRIEFING/DEBRIEFING GUIDE

Use this attachment as a guide for evaluating how well you or members of your crew/test team interacted during missions. Identify strengths or weaknesses that you or members of your crew/test team can build on with the focus on improving your CRM skills. Units are authorized to reproduce this attachment and place it in local flight briefing guides.

Situational Awareness:		
Anticipates, monitors, prevents loss, recognizes own/others loss, regains SA	Vs	Disoriented, confused, lost, fixated
Crew Coordination/Flight Integrity:		
Leads, identifies roles/expectations, sets tone, respects, encourages, assertive	Vs	Judges, ridicules, over reacts, ignores, imposes, accepts error
Communication:		
Clear, concise, listens, interprets, efficient, gets/gives feedback	Vs	Interrupts, withholds, discounts, ambiguous, mumbles
Risk Management/Decision Making:		
Identifies/assesses problem, explores solutions, makes appropriate decision, involves and informs crew	Vs	Avoids, delays, vacillates, argues, fails to consider consequences of
Task Management:		
Prioritizes, assign tasks, creates time, plans, delegates, checklist discipline	Vs	Rushed, overloaded, complacent

Mission Planning/Debrief:

Objective, thorough feedback, nonthreatening, recaps key points, solicits inputs, provides corrective actions	Vs	Rushed, incomplete, vague, lectures, blames, ignores

WILBERT D. PEARSON, JR.
Brigadier General, USAF
Director of Operations